

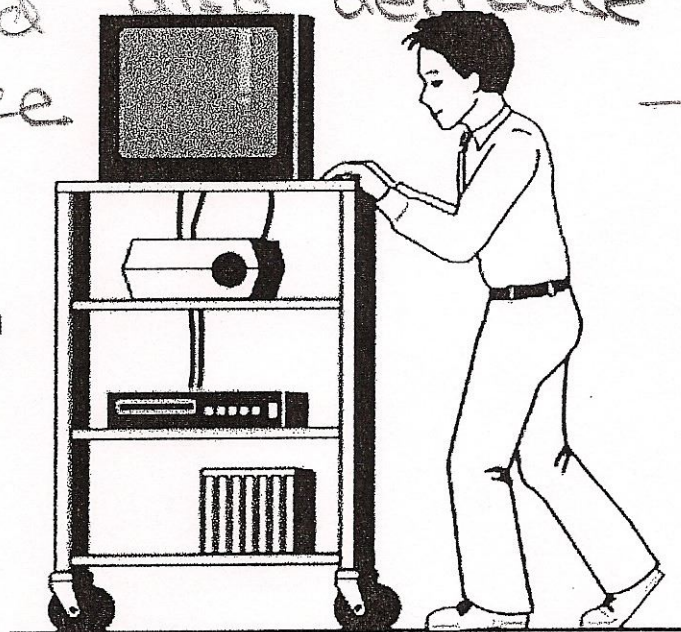
## Math in Science

Using the drawing, answer the following questions. (8 points each)

11. Newton's second law is often written as  $F = ma$ . How does this law describe the relationship among force, mass, and acceleration?

If you increase acceleration then you will have a greater force, and it is the same for mass. you could also decrease them for a smaller force.

Total mass = 55 kg



12. Calculate the force needed to accelerate the video cart  $2.0 \text{ m/s}^2$ . The formula for calculating force is  $F = ma$ .

$$F = (55 \text{ kg})(2.0 \text{ m/s}^2) = 110 \text{ N}$$

13. Another piece of equipment is added to the cart, making its total mass 60 kg. If the cart is accelerating at  $3.0 \text{ m/s}^2$ , what is the force being applied to the cart? The formula for calculating force is  $F = ma$ .

$$F = (60 \text{ kg})(3.0 \text{ m/s}^2) = 180 \text{ N}$$

14. A student applies a force of 85 N to the cart. What is the acceleration of the cart?

The formula for calculating acceleration is  $a = \frac{F}{m}$ .

$$a = \frac{85 \text{ N}}{55 \text{ kg}} = 1.54 \text{ m/s}^2$$